# Schema Mapper: Implementation Log

#### overview

A system that converts text to JSON following any schema. Uses Azure OpenAI GPT-4 + Streamlit web interface.

## **Development Process**

## Phase 1: Basic Setup

Files: main.py, logger.py, .env

- Researched best LLMs for JSON output and handling large schemas (e.g., GPT-4, Claude 3, Gemini 1.5, JSONFormer(huggingface))
- Compared model capabilities: context length, JSON mode reliability, and schema adherence
- Finalized basic project structure with modular design for model calls, parsing, and schema validation
- Set up connection using Azure AI Foundry to access OpenAI's GPT-4
- Created logging system with timestamped files

## **Phase 2: LLM Configuration**

#### Experiments:

- Temperature: Tried 0.1 (too rigid)  $\rightarrow$  0.8 (too creative)  $\rightarrow$  0.4 (perfect balance)
- JSON Mode: Reduced non-JSON responses by 95%
- Top-p: Set to 0.9 for quality balance

## **Phase 3: Prompt Engineering**

#### Evolution:

- 1. Basic: "Convert text to JSON" → Failed often
- 2. Detailed: Added numbered steps → Better compliance
- 3. Final: Explicit data type rules  $\rightarrow$  Best Results

## Current Prompt Strategy:

- Clear numbered instructions.
- Explicit boolean handling.
- Schema adherence enforcement.

# **Phase 4: Testing**

All three test cases were successfully passed:

- 1. Academic Paper (BibTeX → Citation JSON)
- 2. GitHub Actions (Description → Config JSON)
- 3. Resume (Text  $\rightarrow$  Structured JSON)

# **Phase 5: Web Interface**

File: app.py

- Built a minimal Streamlit app
- Enabled file upload and side-by-side input/output view
- Added basic download functionality.